Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Relativistic many-body calculations of lifetimes, rates, and line strengths of multipole transitions between $3l^{-1}4l'$ states in Ni-like ions[1]

U.I. SAFRONOVA, A.S. SAFRONOVA, University of Nevada, Reno, P. BEIERSDORFER, Lawrence Livermore National Laboratory — Transition rates and line strengths are calculated for electric-multipole (E1, E2, and E3) and magnetic-multipole (M1, M2, and M3) transitions between $3s^23p^63d^94l$, $3s^23p^53d^{10}4l$, and $3s3p^63d^{10}4l$ states (with $4l = 4s$, $4p$, $4d$, and $4f$) in Ni-like ions with the nuclear charges ranging from $Z = 34$ to 100. Relativistic many-body perturbation theory (RMBPT), including the Breit interaction, is used to evaluate retarded multipole matrix elements. Transition energies used in the calculation of line strengths and transition rates are from second-order RMBPT. Lifetimes of the $3s^23p^63d^94s$ and $3s^23p^63d^94d$ levels are given for $Z = 34$–100. Taking into account that calculations were performed in a very broad range of Z, the most of the data are presented in graphs as Z- dependences. The full set of data is given only for Ni-like Mo and W ions. These atomic data are important in modeling of M-shell radiation spectra of heavy ions generated in electron beam ion trap experiments and for fusion research.

[1]Work was supported by NNSA under DOE Cooperative Agreement DE-FC52-06NA27588. Work at LLNL was performed under of auspices of the DOE under contract No. W-7405-Eng-48.

Ulyana Safronova
University of Nevada, Reno

Date submitted: 30 Jan 2007 Electronic form version 1.4